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Four hundred and seventy-third meeting.

December 13, 1859. — MONTHLY MEETING.

The PRESIDENT in the chair.

Professor James Hall made a detailed communication upon the fossil Crustacea of the genus *Eurypterus*, DeKay, its species, and their geological relations; illustrated by a full suite of specimens, and by drawings.

Professor Agassiz discoursed upon the morphology of the genus *Eurypterus*, and its place in the zoölogical system. He considered it an undoubted member of the family to which Trilobites belong, and of which the genus *Limulus* is the present representative.

Chief Justice Shaw read a paper upon the use of granite as a building material, and upon the introduction of the present mode of working it: —

The discussions which have recently taken place respecting the Hancock House have revived my recollections of the history of stone masonry and the use of granite as a building material in Boston, and offer an occasion for stating what appears to me to have been an important discovery in the art of working granite within a comparatively brief period. It was said, I believe, of a great man of antiquity, as one of his highest claims to the gratitude of his countrymen, that he found the city of brick, and left it of marble. We think that every one feeling just sentiments of pride for the beauty, permanency, and grandeur of the city of his home, in the taste and utility of its public and private buildings, must take a deep interest in knowing the value, cheapness, and excellence of the building materials within its power for practical use. The vast number and magnificence of the granite buildings recently erected in various parts of the city increases the interest we naturally feel, in knowing the steps which have led to this extension of the art, by which granite is brought into use. My main object is to state a fact respecting it which I have never seen stated, which appears to me to be not generally known, and which came to my knowledge under such circumstances as to command my belief.

It is believed that, although granite has always abounded near Boston, it was not till some time in the earlier part of the last century that it was used for the building material of houses, but was used only for wharves, cellars, and wells, where smooth and even walls were not required. It is believed that during the first century of the existence of Boston, when smooth building-stone was required to be used with brick building, as for basements, corners, window-frames, or the like, freestone was used, being the red-sandstone of Connecticut River.

At some time between the end of the first quarter and the middle of the eighteenth century, that is, now a little more than one hundred years ago, the practice of stone-hewing and hammering for the working of granite was first introduced into Massachusetts by German emigrants. It is understood that Brigadier-General Waldo brought a colony of German emigrants from their native country, a large number of whom settled at a place called Germantown, then in the town of Braintree, now Quincy. A large part of this colony proceeded, under the care of General Waldo, to Maine, and settled in a new township thence called Waldoborough, from which many settlers of German origin spread into other towns in Maine.

The Germans who remained in Braintree introduced several branches of the mechanic arts, which had not before been in use in this country. That of stocking-weaving was one; it was there introduced, and has been practised by their descendants until within a few years, if it is not continued to the present time.

Another of the arts was glass-making, which was probably the first establishment of glass-works in this part of the country. They manufactured glass-ware and toys, and it is believed window-glass, though the glass was not sufficiently clear and transparent for good window-glass, and the business was mainly confined to green-glass bottles and other green-glass articles. Many families had quantities of bottles made and stamped with the family name on the bottle. Such a one is there occasionally seen.

But what is more material to my present purpose is, that this class of German artisans first introduced into this country the practice of preparing hewn or hammered stone, wrought to a plain surface, sufficiently straight and smooth to make a regular wall. The process as then practised by them, and those who were instructed by them, was understood to be extremely laborious, and of course expensive, as the expense depended wholly on the amount of labor required for preparing it. Without describing the process precisely, which I do not understand sufficiently to do, I understand the first thing to be done was, if the rock was in a quarry, to blast out a portion of it by gunpowder. By this process, fragments would come out in all sorts of irregular forms, as by mere chance. The business of the workman then was to take the pieces of more regular form, and reduce them to smaller and more regular shapes, as wanted for building. This is done by cutting a groove on a straight line with a hammer made with a cutting edge like that of a common axe, then striking it with a very heavy iron beetle on each side of the groove alternately, until it would crack, generally in the line of such groove. This would sometimes split in a line nearly straight through, though it would often be irregular. In this mode, by dividing and subdividing, the pieces were brought as nearly as practicable to the dimensions required; and then all the irregularities of surface must be removed by hard hewing with very heavy instruments.

In this state of the trade, although stone might be got out and dressed and made suitable for building, yet few buildings were erected, probably on account of the great expense. Some of our older inhabitants may perhaps recollect the stone house at what is now the corner of Tremont and Somerset Streets, long the hospitable mansion of Jeremiah Allen, Esq., a former Sheriff of Suffolk, and celebrated for the number of good dinners given there. There was another granite house on School Street next below the Chapel, owned by John Lowell, Esq., who removed it and erected Barristers' Hall on the same site. But by far the most conspicuous dwelling was the Hancock House, still standing, built by Mr. Thomas Hancock. He was a native of Braintree, became a wealthy merchant, and probably chose to gratify his townsmen and himself by adopting, as the material for his sumptuous dwelling, one of these staples of his native town, without much regard to the cost. He was the uncle of John Hancock, and, dying without children, gave the house to him. Governor Hancock had been erecting a house for himself at the corner of Court and Tremont Streets, but having received from his uncle a gift of the Hancock House, about the time his own was ready for occupation, it is believed he never lived in the one he built.

One other granite building of the same period, the most important of all, remains to be referred to, — the "King's Chapel." This was commenced in 1752 and finished about 1755 or 1756. It was built entirely of hammered stone obtained from the North Common in Braintree, corresponding nearly if not exactly with the present granite quarries in Quincy. It was designed as an Episcopal Church for the accommodation of the king's officers, of the Provincial government, revenue officers, and Provincial gentry; and was intended, in its sumptuous character, to be as near an approximation as possible to an English church, and was very properly denominated the "King's Chapel."

When this work was finished, it was the wonder of the country round. People coming from a distance made it an object to see and admire this great structure. The wonder was that stone enough could be found in the vicinity of Boston fit for the hammer to construct such an entire building. But it seemed to be universally conceded, that enough more like it could not be found to build such another.

The stone-trade and stone-quarrying remained nearly in the same condition, it is believed, until about the end of the last century. Soon after that time, an extraordinary change took place; buildings of wrought granite, both the light-colored granite of Chelmsford and Tyngsboro' and the dark granite of Quincy, were used in erecting private and public buildings; a new spring was given to the business of getting out stone, which has continued to the present time. During the first few years of the present century, many new private buildings were erected; in 1810 or 1811 the Court-House in School Street was built, after a plan by Mr. Bulfinch; in 1814, the church on Church Green, Summer Street, was completed, and many others followed in regular succession up to the present time; and now the city seems rapidly filling with structures of granite of the most sumptuous character.

It becomes a most interesting inquiry to what this great change can be attributed. To call the attention of the public to this point, is the sole purpose of this communication.

I have always understood that the change was caused by the art of splitting granite with small wedges, which was unknown here till about the time in question. This art, apparently not difficult, or requiring any great skill, was yet of so great importance as to facilitate the working of granite, and reduce the cost to such a degree, as to render it a comparatively cheap building material, regard being had to its strength, durability, and beauty.

The process, now so familiar, is a simple one, requiring no complicated apparatus, and no unusual skill or force when once known. But if, as it is supposed, it has produced these great changes, furnished the community with a most excellent building material at a cheap rate, and has filled our city with the permanent and sumptuous structures which are everywhere rising to constitute one of its chief ornaments, it seems an object of laudable curiosity to ascertain its origin and introduction, to learn who invented or first practised it, or whether it was in use elsewhere, and brought here, and by whom.

This brings me to my main purpose, a statement given by the late Governor Robbins of Milton, as to the origin of the art of splitting stone. I give it with all the names and particulars, in order that the statement may be verified, or refuted, by showing another and a different origin of the introduction of this art, or by showing some other mode in which it was invented, or brought here from elsewhere.

Prior to 1798, Castle Island in Boston Harbor, now Fort Independence, was the prison of the State, where convicts were sent to be punished by confinement and hard labor. About that time, the United States, in anticipation of hostilities with the French, were desirous of having possession of Castle Island, in order to erect thereon a strong fortification for the defence of Boston, and for that purpose urged on the Commonwealth the necessity of having immediate possession of the island. The Commonwealth acceded, and caused the prisoners to be removed, although the State prison at Charlestown was not built or ready for their reception, nor was it so for some time after. This fixes the time when the State prison was in the process of building. Governor Robbins of Milton was one of the first Commissioners, and in this capacity put himself into communication with all the workers and dealers in stone, and found their prices very uniform, though, as he thought, very high.

The narrative I am about to state he made to me some twenty years after. I was then one of the agents for the public, in erecting a stone building for the county, and probably that was the occasion of my interview with him. It was this: —

Desirous of getting the stone for the prison on the best terms, and believing the prices high, though general, he thought much and conversed much on the subject. In that state of mind, and deeply interested in the subject of stone, he had occasion to pass through Salem in a chaise. In passing along a street, he noticed a building apparently new, the basement story of which was of stone. He stopped to look at it carefully. In doing so, he perceived along the margin of each stone the marks of a tool at distances of six or seven inches apart. This was something new. He had never seen it on hewn stone. He immediately inquired for the owner, and saw him, and asked if he knew how and by what process those stones were got out and wrought. He said he did not, but referred him to the contractor, who did most of that species of work in Salem, by the name of Galusha. As I took the name by the sound only, the orthography may be different, Galoucia or Galooshy. He then proceeded to find Mr. Galusha, and to ask him whether he got out those stones, and by what process. He said he did not get them out himself; that they were obtained in Danvers, two or three miles distant, and were furnished him by a man named Tarbox. Upon asking for directions to find Mr. Tarbox, Governor Robbins was told that he was a very poor man, being in an obscure situation in Danvers, near the place where the stone was quarried. Governor Robbins, determined to pursue the inquiry, immediately proceeded to Danvers, and, after considerable inquiry, he found Mr. Tarbox, in a small house, with a family, and with every appearance of poverty about him. After some little preliminary conversation, he asked Mr. Tarbox if he got out the stone in question, and if so his method. He told him he had, and immediately proceeded to explain the process, and showed him his tools, his mode of drilling the holes, and inserting and driving the small wedges as above described.

Governor Robbins was at once struck with the idea that it was new and peculiar, and might be a very important invention. Governor Robbins did not say that he asked whether it was an invention of his own, or whether he had learned it of anybody else. But as it was new to himself, I think he was impressed with the belief that it was the invention of Tarbox. He seemed, however, not to feel that he had any exclusive or peculiar interest in the use of this art. Governor Robbins then asked him if he would consent to go up to Quincy and work two or three months and split stone in his mode, so that other workmen might practise it. He said it was impossible for him to leave home; that his family were dependent on him for their daily bread, and that he had no clothes suitable to go from home. Governor Robbins obviated all his objections by making provision for the family during his absence, also engaged to give him two or three times the monthly wages usually paid the best stone-cutters, and the man consented. Having made the necessary arrangements, he took him to a clothing-store in Salem, obtained him a suitable outfit, then took him into his chaise and brought him to Quincy. Governor Robbins added, that he introduced Mr. Tarbox to several of the principal stone-dealers, and that it was not three months before every stone-cutter in Quincy could split stone with small wedges as well as Mr. Tarbox. Also that this improvement in the working of granite had in a very short time the effect to reduce the price to five eighths of its former cost; that is, that the cost of the dimension stone wanted for the prison, which had before been $4.00, was afterwards reduced to $2.50, and other granite work in similar proportion.

I have been thus particular in naming persons and stating circumstances, in the hope that some persons still live, either at Salem or Quincy, who can throw light on the subject. It would be very extraordinary if an art of so much importance should be traced to a source so obscure as poor Mr. Tarbox, who seems to have been hardly conscious that he was doing anything extraordinary. It may be that this whole narrative rests on some mistake, and that a different origin for this art of working granite may be shown; if so, it is very desirable that it should be made known to the public.

Four hundred and seventy-fourth meeting.

January 10, 1860. — MONTHLY MEETING.

The PRESIDENT in the chair.

The correspondence of the Academy, since the preceding meeting, was read by the Corresponding Secretary.

Professor Agassiz gave a sketch of the plan upon which he is arranging the Museum of Comparative Zoölogy at Cambridge; viz. in separate faunæ, with also an assorted typical collection to illustrate the general systematic arrangement.

Dr. C. T. Jackson exhibited a specimen of meteorite containing olivine or chrysolites, like the celebrated Siberian meteorite of Pallas. The specimen was detached from a large mass, at least five feet in diameter, recently discovered upon the summit of a mountain in Oregon, in the vicinity of Rogue River. Dr. Jackson also exhibited specimens of some other North American meteorites.